**JOB DESCRIPTION**

**Ref:**

**Job Title: Aerosol data assimilation postdoctoral position**

**About BSC:**

BSC-CNS (Barcelona Supercomputing Center – Centro Nacional de Supercomputación) is the National Supercomputing Facility in Spain and was officially constituted in April 2005. BSC-CNS manages MareNostrum, one of the most powerful supercomputers in Europe, located at the Torre Girona chapel. The mission of BSC-CNS is to investigate, develop and manage information technology in order to facilitate scientific progress. BSC combines HPC service provision and R&D into both computer and computational science (life, earth and engineering sciences) under one roof and currently has over 400 staff from 41 countries. To get an idea of what its like to work at the BSC take a look at this video: <https://www.youtube.com/watch?v=VRkEii7OzRE>

**Context and Mission:**

Within the Earth Sciences Department of Barcelona Supercomputing Center, the Atmospheric Composition (AC) group led by Carlos Pérez García-Pando aims at better understanding and predicting the spatiotemporal variations of atmospheric pollutants along with their effects upon air quality, weather and climate.

The AC group develops the Multiscale Online Non-hydrostatic AtmospheRe CHemistry model (MONARCH). MONARCH contains advanced chemistry and aerosol packages, and is coupled online with the Non-hydrostatic Multiscale Model (NMMB), which allows for running either global or high-resolution (convection-allowing) regional simulations, and is coupled with an aerosol data assimilation system based on the Local Ensemble Transform Kalman Filter (LETKF).

The group contributes to a variety of forecasting activities. The dust component of the runs operationally at the first WMO Regional Specialized Meteorological Center for Atmospheric Sand and Dust Forecast (i.e., the Barcelona Dust Forecast Center, BDFC), and contributes to multi-model ensemble forecasts both at the WMO Sand and Dust Storm Warning Advisory and Assessment System Regional Center (WMO SDS-WAS RC) for Northern Africa, Middle East and Europe, and the International Cooperative for Aerosol Prediction (ICAP). Both WMO Regional Centers are co-hosted by BSC and the Spanish Meteorological Agency (AEMET). The group also develops and maintains the CALIOPE air quality system (“CALIdad del aire Operacional Para España”), which provides high-resolution air quality forecasts over Europe and Spain using the in-house emission model HERMES.

**Key Duties**

**The candidate will work on the assimilation of observations. He or she will work to maintain and further improve the current aerosol data assimilation scheme (based on a LETKF) in different aspects: the characterization of model uncertainty through an EPS, the treatment of assimilated observations (both profile and column-integrated observations), and the evaluation of their impact in the monitoring and forecast of atmospheric composition species. This work will be done through close interaction with other group members. The candidate will also contribute to other tasks, such as the adaptation of the data assimilation scheme for new NMMB-MONARCH model developments, the production of a mineral dust reanalysis, the maintenance of code and relative documentation in the department shared repository, and the improvement of the efficiency of the code performance on HPC platforms, in collaboration with the colleagues from the Computational Earth Sciences group.**

**Other duties include designing research strategies; developing assay and analysis tools; collecting and analyzing data; presenting research findings; writing manuscripts in peer review publications; assisting grant applications; and other duties as assigned.**

**Requirements**

* **Education**
  + **Having a PhD in Physics, Mathematics, Geosciences or related discipline.**
* **Knowledge and professional experience**
  + In-depth knowledge of data assimilation would be a clear advantage.
  + Experience with atmospheric composition (modeling, data assimilation or observations) would be desirable.
  + Excellent computing skills in high-level computer languages (such as FORTRAN or C), experience with UNIX/LINUX environments and with scripting languages (such as bash) are required.
  + **Knowledge of atmospheric science data formats (GRIB, NetCDF)** and previous experience with scientific software and tools (CDO, NCO, Python or R) will be valued
  + Experience with revision control systems (e.g., SVN or Git) will be valued
* **Competences**
  + Very good interpersonal skills
  + Fluency in English
  + Excellent written and verbal communication skills
  + Ability to take initiative, prioritize and work under set deadlines
  + **Ability to work both independently and within a team**

**Conditions**

The position will be located at BSC within the Earth Sciences department in collaboration with the specific program coordinator. The contract will be for **two** years.

**Applications Procedure**

All applications must be applied in LINK including:

1. A motivation letter
2. A full CV including contact details
3. Two reference LETTERS or CONTACTS

**Diversity and Equal Opportunity Employment**

BSC-CNS is an equal opportunity employer committed to diversity and inclusion. We are pleased to consider all qualified applicants for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, disability or any other basis protected by applicable state or local law.